_**bio**materials

for designers

Biomaterials for designers takes a hands-on approach to the exploration of biomaterials in design and fabrication processes. The course will focus on two primary materials: myco-composites and agar-based bioplastics. A myco-composite is a material composed of mycelium (the growing body of a fungi organism) and substrate upon which it grows (hemp, hardwoods, agricultural/food waste…). After achieving full growth, a myco-composite is dried and maintains the structural integrity and material characteristics of Styrofoam yet is fully compostable and/or recyclable for manufacturing more myco-composite. Agar based bioplastics derived from a mixture of agar (dried seaweed), vegetable glycerin, and water will be utilized as both a sealant and colorant (when mixed with natural dyes) for the myco-composite. Through a controlled dehydration process we will also produce bioplastic as a stand-alone sheet material. This material may also be combined with other biomaterials and/or waste streams to produce a composite bioplastic.

Prior to mycelial growth a myco-composite is a loose agglomeration of materials without form (think of mulch.) The myco-composite requires a form or mold within which to grow. A great deal of time and effort in the course will be devoted to the design and fabrication of molds in which to grow the myco-composite. This production may engage a wide range of processes from analog fabrication techniques (wood-shop, sewing, model making) to vacu-forming, laser cutting, milling, and/or the use and adaptation of found objects as molds or parts of molds. Additionally, other materials (cardboard, wood, fibers, recycled plastics) may be imbedded in the myco-composite to increase its structural capacity (like rebar in concrete) and to create flanges (exposed meeting connections and surfaces) to facilitate combining myco-composite parts with each-other and other materials.

A critical component of our explorations will be the establishment of a knowledge base for the propagation and maintenance of mycelium strains and coverage of the proper procedures and lab techniques for sterilizing substrates and other mediums required for mycelial growth and storage. Given time, we may even grow a mushroom or two :)

Texts: Radical Mycology – Pete McCoy, The Mushroom Cultivator – Paul Stamets, Entangled Life – Merlin Sheldrake, Green Plastics – E.S. Stevens, Fungal Architectures – Adamatzky, Wosten, Ayres

Prerequisite: Arch 537: Fabrication or equivalent with permission of instructor.